

Variational Methods in Computation

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Variational methods are normally associated with classical mechanics and physics. They lead quite naturally to the formulation of physical processes in terms of the Hamiltonian, where energy conservation is the guiding principle. It is a long time since I have studied the standard approach to variational calculus, however my research in mental computation suggests that variational methods have applications in this field, and may prove useful in assessing the power and simplicity afforded by the vedic computational techniques.

Firstly let us consider what are the general principles which guide the mental processing of vedic computation. Generally speaking every computational process has many ways to reach a resolution, each of them requiring a certain amount of skill and dexterity. In a very real sense each process requires a certain amount of mental energy. Although the steps themselves are discrete, we can view them as the discretisation of a continuum of computations. Effectively we are traversing a computational space of processes in order to go from a desire, to the first fruit of that desire. It takes a certain amount of time and practice to develop these mental computational skills, as in a very real sense our minds have to be retrained away from the discrete step approach favoured by modern mathematics driven by discrete logic.

One very interesting aspect of practising natural mental computation is what I will refer to as the *push through*. When we are confronted with a new computation of a type we have not encountered before it may take a certain amount of skill and effort to apply the vedic principles of computation to find our way through the computational space from desire to fruit. It's like we first have to know the result of our effort, before the computations become effortless. We begin to see patterns in the result which make other approaches much simpler. This always fascinated me, and I could never account for this aspect of mental computations. Now however I suggest that it is similar to a variational process where the computation traverses all possible paths, we are delving in to the field of all possibilities, in performing the computations. To a very real sense we transcend the discrete steps until the computations are performed instantaneously.

Another aspect of these methods is their effect on both long term and short term memory. Just by stating or putting a tiny bit of focus on a sum, our memory immediately recalls the answer, without any effort. This contrasts very much with the laborious methods of logic based mathematics, with endless repetition of unnecessary tables, as the basis for multiplication etc. The mind quickly tires of this rote system and the hand quickly reaches for a calculator, thus defeating the very purpose of even basic arithmetic. No matter what fancy name is put on mathematical education, Project Maths in Ireland, unless a natural computational approach is integrated as a part of the curriculum the system is doomed to stultify the minds of the students and fill it with digital rust, an abhorrence of mathematics and a large failing in the educational system itself.

I am of the very real opinion that no student ever fails, it is the system which fails, in spite of the glowing reports which may be received from such organisations as the OECD. It is a failed system measuring a failed system.

So how do we remedy this within the current system. The quickest remedy is to adapt [The Cosmic Computer Course](#), developed by Kenneth Williams, my collaborator for seventeen years, and Mark Gaskell. This is a shortened version of a course developed for O level students in the UK, and is eminently suitable for adults. It would make a very suitable course for teachers, who could then adapt the techniques for their pupils as needs be. It would not require any expensive development. One point here is that if this approach is adopted, parents must be included in the process. They must be informed at the outset that new material is being added to the curriculum, and also the material must be made available to them. This could very easily be done on-line, through a nationwide network, providing resource material at all levels of our educational system.

Conclusion

So we have gone from an abstract discussion of my perception of mental computational methods to a very practical plan to immediately remedy the huge problems that exist within the field of education. I outlined these to a former Minister for Education, Michael Martin, in a letter I wrote to him in 1998, after meeting with two schools inspectors in the departmental office in Cork. Unfortunately the advice he received in respect of this meeting was incomplete. I was not without failing in this respect as I had not realised the significance of language, the Irish language in particular. I remedied this over the course of a number of years. This led to the development of Dútháireamhaíocht, an even more powerful expression of natural computation, which had allowed me to adapt computational knowledge into 150 languages, in a very natural and empathetic manner, which respects the cultural norms of the target language. I will express more on this at a later stage.

Further Information

For further information on Vedic Mathematics you may link on line to the Vedic Maths Academy book shop and purchase [The Cosmic Computer Abridged Edition](#).

Acknowledgement

This short paper is dedicated to the late Professor Jim Flavin, my Professor of Mathematical Physics, at University College Galway, and from whom I received my training in Variational Calculus.